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March 14, 1953

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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Tops In Talent

See Page 162

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GENERAL SCIENCE

Top Scholarship Winners

E. Alan Phillips of Weston, Mass., 15-year-old winner of \$2,800 award, is youngest ever to take top prize. Paul H. Monsky of Brooklyn, N. Y., won \$2,000 scholarship.

See Front Cover

► A 15-YEAR-OLD Massachusetts boy, who started learning algebra when he was six and who cannot remember when he could not read and write, has been chosen as the nation's leading potential scientist.

E. Alan Phillips won the \$2,800 Westinghouse Grand Science Scholarship after exhaustive winnowing of the nation's high school seniors in the Twelfth Annual Science Talent Search, administered by SCIENCE SERVICE and the 15,000 Science Clubs of America.

Young Mr. Phillips, shown on the right in the cover picture of this week's SCIENCE NEWS LETTER, is a senior at Weston High School, Weston, Mass., and lives in Lincoln. His father is a retired professor of mathematics at Massachusetts Institute of Technology.

In the five-day Science Talent Institute attended in Washington by the 40 top winners from 20 states, Mr. Phillips showed he is already thinking and speculating about the farthest frontiers of science. In fact,

his conversations indicated that he is taking up where Nobelist Dr. I. I. Rabi, Columbia University physicist, left off in a talk he gave during the Institute. (See p. 169.)

Mr. Phillips speculated about the possibilities of producing negative protons. One of his ideas was that if they were produced, they would have to be used instantaneously, or else they would be lost.

Paul H. Monsky, 16, who graduated this January from Brooklyn Technical High School, N. Y., took second place and a \$2,000 Westinghouse Science Scholarship. He hopes to be a mathematical physicist. His picture appears on the left on the cover of this week's SCIENCE NEWS LETTER.

Eight others received \$400 scholarship and the other 30 received \$100 scholarships.

The 40 young scientists heard an address by Dr. Leonard Carmichael, secretary of the Smithsonian Institution, during the banquet ceremonies at which the awards were presented. (See SNL, March 7, p. 154.)

For excerpts from the winners' reports, see p. 175.

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SCENES AT SCIENCE TALENT INSTITUTE — Top left, ten top winners with J. H. Jewell of Westinghouse Electric Corporation, Dr. Leonard Carmichael and Dr. Harlow Shapley; top right, the two top winners being congratulated by Watson Davis and Dr. Carmichael; 3, Michael Grant, Charles Gross and Thayer French blow out candles to celebrate their birthdays which fell during the Institute; 4, Drs. Shapley and I. I. Rabi discuss the theory of anti-matter with some of the 40; 5, Karen Spangehl and Martin Tangora check the instrument developed by Dr. Henry Kalmus of the National Bureau of Standards to measure blood and other fluid flow (see SNL, March 7, p. 149); 6, Eleanor Wright and Edward Menbinick talk with their Congressman, James C. Davis (D., Ga.) at the Congressional Dinner; 7, Barbara Wolff and Andrew Kende, two top winners in 1948, discuss their experiences since that time with some of the young scientists; 8, Drs. Alexander Wetmore of the Smithsonian Institution and William Mann of the U. S. National Zoological Park get helpful hints on how to eat buffalo steak from Joanna Russ and Edward Menbinick.

GENERAL SCIENCE

Winners of Scholarships

GRAND SCHOLARSHIP OF \$2,800

Phillips, Edward Alan, Weston, Mass.

\$2,000 SCHOLARSHIP AND ALTERNATE FOR \$2,800

Monsky, Paul Henry, Brooklyn, N. Y.

ALTERNATE TO THE \$2,000

Tangora, Martin Charles, Evanston, Ill.

SCHOLARSHIPS OF \$400

Barnes, Virgil Everett, Jr., Austin, Texas
Moffet, Alan Theodore, Rochester, Minn.
Mumford, David Bryant, Exeter, N. H.
Pearlmutter, Arthur Edward, Forest Hills, N. Y.
Russ, Joanna Ruth, New York, N. Y.
Tangora, Martin Charles, Evanston, Ill.
Willis, John Steele, Pasadena, Calif.
Wolfe, Jack Albert, Portland, Ore.

ALTERNATES

1st alt. Duchane, Emma Marie, New York, N. Y.
2nd alt. Pirone, Dominick Joseph, White Plains, N. Y.

SCHOLARSHIPS OF \$100

Brayton, Paul Richard, Los Angeles, Calif.
Cassidy, Harry Joseph, Painted Post, N. Y.

Clark, Dennis Richard, Los Angeles, Calif.
Claytor, Richard Nelson, Tulsa, Okla.
Duchane, Emma Marie, New York, N. Y.
Forman, Merle Regina, Brooklyn, N. Y.
French, Thayer Carlton, Lakeville, Conn.
Grant, Michael Peter, Oshkosh, Wis.
Gross, Charles Gordon, Brooklyn, N. Y.
Harte, Kenneth Jeremy, Scarsdale, N. Y.
Hopf, Barbara E. G., Bloomington, Ind.
Isles, David Frederick, Cranford, N. J.
Itokawa, Etsuyo, New York, N. Y.
Kirtley, Mary Elizabeth, Mansfield, Ohio
Larson, James Daniel, Independence, Mo.
Lubin, Jonathan Darby, Tottenville, N. Y.
Menhinick, Edward Fulton, Chamblee, Ga.
Mitchell, Merle Almazetta, Norfolk, Va.
Pirone, Dominick Joseph, White Plains, N. Y.
Resnikoff, Howard Lenard, Brooklyn, N. Y.
Reynolds, John Charles, Glen Ellyn, Ill.
Rubinstein, Robert Leonard, Brooklyn, N. Y.
Schmoyer, Laurence Frederick, Allentown, Pa.
Shore, Robert Avery, Brooklyn, N. Y.
Sosin, David Elliott, Highland Park, N. J.
Spangehl, Karen Mateel, Phoenix, Ariz.
Strax, Norman, Great Neck, N. Y.
Swarnier, David Reynolds, Valparaiso, Ind.
Winter, John Mack, Jr., Vermillion, S. D.
Wright, Nancy Eleanor, Atlanta, Ga.

Science News Letter, March 14, 1953

MEDICINE

Tests Show Value of New Antibiotic Drug

► EVALUATION TESTS at the University of California at Los Angeles on carbomycin, an antibiotic, indicate that a new "wonder drug" may be in the offing.

Made by a fungus obtained from soil, carbomycin has indicated capability of continuing the fight against many diseases where other antibiotics have become ineffective due to development of resistance by infecting organisms.

Carbomycin, originally developed in the Charles Pfizer and Co. laboratories in Brooklyn, N. Y., has been evaluated in laboratory and clinical studies by Dr. William Hewitt of the University of California at Los Angeles School of Medicine and Wadsworth Veterans Hospital.

The drug seems particularly effective against staphylococcal infections, pneumonia and other respiratory infections which in some cases no longer respond to penicillin, aureomycin and terramycin.

Dr. Hewitt's studies have also indicated that carbomycin may be effective against amebic dysentery and rickettsial diseases such as Q fever.

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DENTISTRY

Ammoniated Dentifrices

► A REPORT questioning the value of ammoniated dentifrices for reducing tooth decay has appeared in the *Journal of the American Dental Association* (March).

It is based on extensive research studies made by Dr. B. G. Bibby, director of the Eastman Dental Dispensary at Rochester, N. Y., and Lt. R. R. Hawes of the Air Force Dental Corps at Randolph Air Force Base, Tex.

"There is no satisfactory evidence—notwithstanding the advertising claims—that a dentifrice with a high urea content reduces dental decay," they said.

Ammoniated dentifrices are tooth pastes and powders containing the ingredient urea to which the compound dibasic ammonium phosphate is usually added.

To evaluate the effectiveness of ammoniated dentifrices, the dental scientists conducted a one-year clinical and bacteriological study among school children between the ages of seven and 13.

In the clinical study, an experimental group of 196 children brushed their teeth with an ammoniated dentifrice, while 176 children served as a control group and

brushed their teeth with a neutral or cosmetic dentifrice. Neutral or cosmetic dentifrices are those with conventional cleansing properties.

All the children were instructed in a proper toothbrushing technique, which was carried out under supervision at the beginning of each school day and independently at home in the evening.

The investigators found that during the test period, the children who used the ammoniated dentifrice were found to develop tooth decay at approximately the same rate as those using the non-ammoniated type.

Drs. Bibby and Hawes said that their studies indicated that ammoniated dentifrice had little effect on the presence of lactobacillus in saliva. A count of these bacteria in saliva has long been used to measure decay activity. They concluded:

"The negative clinical observations and laboratory findings . . . offer adequate grounds for questioning the soundness of the concept that the ammonium ion dentifrices have any value in the prevention of dental decay."

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PSYCHOLOGY

Telling Children's I.Q.

► MANY A mother, discussing her child with neighbors or relatives, will glibly speak of Junior's "I.Q." She may know that the letters stand for intelligence quotient and that tests were given to determine Junior's I.Q. But her knowledge very often stops there.

Even Junior's teacher may find psychological tests surrounded to some extent with an aura of mystery. Miss Lilian Mould, herself a teacher, states in a report to *Understanding the Child* (Jan.), publication for teachers of the National Association of Mental Health.

From her experience as intern in clinical psychology at the Central New Jersey Mental Hygiene Clinic, Miss Mould gives the following explanation of the Stanford Binet Intelligence Test, widely used to determine a child's I.Q.:

"It consists of a group of tests for each age level. The eighth-year level, for instance, has six tests to be administered, the ninth has six others, somewhat different, and of course more difficult. The test covers adult levels also. In administering the Stanford Binet, a 'basal level' has to be established. This is the year level on which the child performs all tests successfully. From the basal the child works up until he reaches the year level where all tests are too difficult. This is called the 'ceiling.' The score achieved yields a mental age, and from this and the chronological age an intelligence quotient is determined.

"If basal and ceiling levels are both very close the child's chronological age, it can usually be assumed that he is 'running on all cylinders,' and is capable of average achievement.

"However, often a child can do only a few tests on many levels; his basal score may be several years lower than his life age, and the ceiling several years above. When this happens, the 'scattering' of the results indicates that something is interfering with consistent and effective mental functioning—and that 'something' is often an emotional problem."

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NEUROLOGY

Dreamless Nightmare Gives Fear Physical Basis

► STUDIES OF a terrifying and primitive form of fear, like "a nightmare without the dream," have given scientists the foundations of a physical basis of fear.

The studies were reported in Pebble Beach, Calif., at a joint meeting of the San Francisco Neurological Society and the Southern California Neurosurgical Society by Dr. Donald Macrae of London, visiting neurologist at the University of California School of Medicine.

This primitive fear, apparently rare in human experience, has been observed in 42 patients with epilepsy. Symptoms and brain

wave patterns, among other evidence, suggest that the fear arises from the temporal lobe of the brain. Thus physicians may say, for the first time, that a form of fear is experienced, like the senses, in a specified part of the brain.

A "horrible smell" which accompanies the fear is especially significant, Dr. Macrae thinks. The sense of smell is primitive and known to have its roots in the medial aspect of the temporal lobe, the oldest and most primitive part of the brain structurally and evolution-wise.

Science News Letter, March 14, 1953

The average parachute should last eight and a half years.

SCIENCE NEWS LETTER

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EYE DAMAGE EXAMINATION—Dr. Robert M. Sinskey, Lt. j.g., U.S.N., is shown here examining the eyes with an ophthalmoscope in a study of radiation damage made for the Atomic Bomb Casualty Commission.

MEDICINE

Cataracts From A-Bomb

Chances of damage to the lenses of eyes sufficient for blindness as result of atomic bomb attack found to be small, study using both ophthalmoscope and slit lamp shows.

▶ IF YOU survive an atomic bomb attack, the lenses of your eyes may be damaged by the radiation, even to the point of cataract formation. But the chances of the lens damage being great enough to blind you appear rather small.

This impression is gained from the latest report on radiation cataracts among atom bomb survivors at Hiroshima. The report is the first on a two-year study by Dr. Robert M. Sinskey, Lt. j.g., U.S.N., made for the Atomic Bomb Casualty Commission.

Dr. Sinskey could not give exact figures for the chances of lens damage. He pointed out, moreover, that his findings were for radiation damage, probably neutron and gamma rays, from the first atom bomb. What damage more recently made atom bombs or hydrogen bombs might do could not be told from his study.

Blindness from heat from the bomb was not covered in Dr. Sinskey's report. Scientists working at the Air Force School of Aviation Medicine at Randolph Field, Tex., have calculated that the heat from "the primitive bomb touched off at Hiroshima" would be blinding even at a distance of four miles if the eyes were directly focused on it.

Of the 154 cases of radiation cataract among survivors at Hiroshima, only two had so much loss of vision that an operation was necessary to restore sight, Dr. Sinskey said. These were among 25, out of the 154, which have less than 20/20, or normal, vision. Most of the 23 have "serviceable" vision. In many of these 23, extreme nearsightedness which is very common among Japanese is probably responsible for the loss of vision.

Dr. Sinskey actually found more radiation damage in the eyes of survivors at Hiroshima than had previously been reported. This is because he examined the eyes with both the ophthalmoscope and the slit lamp. Earlier examinations had been made only with the ophthalmoscope which does not show the granules and plaques, looking like an oil slick, at the very back of the eye lens in cases of radiation damage. This appearance also is seen in the eye lens in some cases of old age cataracts, in glass blowers' cataracts and in a few other conditions.

The radiation damage in the eyes of Hiroshima survivors has not progressed in the past three years. Dr. Sinskey considers it unlikely, though not impossible, that it

will progress to the point of causing loss of vision in the future.

The changes in the eye lens Dr. Sinskey described cannot, in an individual case, be diagnosed as radiation cataract. But if there is a history of exposure to ionizing radiation and no other reason for the changes, they may be considered due to the radiation. The patients Dr. Sinskey examined had all lost all their hair. This was taken as a sure sign of exposure to the atom bomb radiation.

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TECHNOLOGY

Quartz Fluorescent Lamp Is Brighter, Lasts Longer

▶ A FLUORESCENT lamp with a quartz inner tube has been developed that gives about two and a half times more light than an equal-wattage incandescent lamp and that lasts about five times longer.

Eugene W. Beggs of the Westinghouse Lamp Division, Bloomfield, N. J., told the International Association of Electrical Inspectors meeting in New York that the new lamp is a combination of a mercury lamp and a fluorescent lamp. Its life is rated at 5,000 hours.

Light from the mercury half is generated in the quartz inner tube. The light contains ultraviolet rays which make phosphors glow on the outer tube. The phosphors glow red and turn the normally bluish-white mercury light into "golden white" light.

Mr. Beggs predicted the lamp would find wide use in factories, stadiums, parking fields, building exteriors, railroad yards and on streets and highways. It is particularly adaptable to large-scale operations, he said.

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PHYSICS

Cosmic Ray Particles Cause Flashes in Sky

▶ FAINT FLASHES of light produced when powerful cosmic ray particles plunge from outer space into the upper atmosphere seem to account for a little of the light of the night sky.

Two investigators, W. Galbraith and J. V. Jelley of Britain's Atomic Energy Research Establishment at Harwell, measured, with a photomultiplier apparatus, the light-pulses of short duration that correlate with cosmic radiation. They made their report in *Nature* (Feb. 21).

These flashes are due to an effect discovered by a Russian scientist, P. A. Cerenkov, in 1934. Cerenkov radiation is blue-white light created when fast-moving particles are shot into a medium such as the atmosphere. It can be explained by assuming that the particles travel faster than light in the same medium. The idea that this kind of radiation was involved in about a ten-thousandth of the light of the night sky was advanced in 1948 by Prof. P. M. S. Blackett, British Nobel physicist.

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PHYSICS

Bomb Blasts Go 50 Miles

Temperature inversion and normally found layers of atmosphere bounce blast waves from an atomic bomb burst back to earth as far as 600 miles away.

► **BLAST WAVES** from an atomic bomb sometimes rise as high as 50 miles into the sky and then bounce back to the ground, research by weathermen in connection with the A-bomb explosions in Nevada has shown. The bounce sometimes throws the blast back onto the ground as far as 600 miles away.

Various temperature inversion and normally-found layers of the atmosphere can act as reflecting surfaces for blast waves from an atomic bomb or from any explosion. That is why some of the force of the Nevada test explosions has been felt as far away as California, Arizona and Utah. That is why some windows were broken in Las Vegas and other places.

Claims for blast damage from the 20 test explosions which have been settled amount to \$42,929, the Atomic Energy Commission says. Weather forecasts in all probability have kept this sum as small as it is. Some tests were postponed on the advice of meteorologists.

The general theory that temperature inversions, the troposphere, the ozonosphere and the ionosphere, are the cause for the seemingly erratic action of blast waves from explosions has been known for some time. However, meteorologists say that never before has there been the opportunity for controlled experiments in blast wave propagation of this number or size.

The AEC says that a fair degree of accuracy was achieved in predicting the pat-

tern of blast waves from any one particular test explosion. However, when the weather forecasts were off, the prediction of blast wave patterns would be off too.

Most of the direct effects of the blast from an atomic bomb of "nominal" or Hiroshima-type strength occurs within a radius of 12,000 feet of ground zero and within 10 seconds after the explosion. However, some waves travel upwards. If the temperature of the air decreased with height at a uniform rate, these waves would just continue upward until they were dissipated.

However, especially over deserts, temperature inversions are sometimes found within 1,000 to 2,000 feet above the ground. This means the air above is warmer than the air below. Some of the blast waves hitting this go on through. Others bounce back. These are concentrated and hit a focal point on the ground. Anything at the focal point might be damaged, depending on how much energy was reflected back to the ground.

The same sort of action can happen when the blast wave gets to the troposphere, six miles above the ground, the ozonosphere, 25 to 40 miles up, and the ionosphere, some 50 miles up.

Wind direction also has something to do with where the focal points will be. Wind can help or deter the atmospheric temperature pattern in determining where the focal points will be.

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FORESTRY

Graft Hybrid Pines

► **ECONOMICAL PRODUCTION** of hybrid pine trees passed from probability to practicality this year, due to a newly developed grafting technique, the U. S. Forest Service has reported.

One seed farm alone produced 55,000 sound hybrid pine seeds this year, enough to reforest 165 acres to hybrid pine, the Forest Service said.

Researchers at the Institute of Forest Genetics in California learned to speed up production of seeds by grafting hybrid seedlings to mature trees. This allows the hybrids to reproduce themselves up to 20 years sooner than would be possible without grafting, the Forest Service said.

Another means of speeding up hybrid pine production being perfected is a new technique for quick germination of seeds after maturation. From seed collected in September it is now possible to produce

seedlings in December equal to planted stock one year old.

Forestry scientists are looking for the same kinds of beneficial results from hybrid trees that agriculturalists have found in hybrid vegetables and fruits. They hope to produce trees that are resistant to insect pests and plant diseases, increase the rate of growth and quality of timber produced, and extend the range over which trees can be grown practically.

But the problems of making tree hybrids are much more complicated than those for vegetable hybrids, the Forest Service said. Artificial pollination of the trees often involves risky climbing high into treetops, or the construction of expensive scaffolding. And where most vegetable hybrids yield seeds after a single season, it may take from 20 to 50 years to obtain hybrid tree seeds.

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• RADIO

Saturday, March 21, 1953, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

E. V. Richards, president of the Louisiana Purchase 150th Anniversary Association, and Streuby L. Drumm, vice-president of the New Orleans Public Service Company, discuss "The Louisiana Purchase."

PROJECTS EXHIBITED—Left to right, beginning at top: Joanna Russ demonstrates the growth of certain fungi under colored light and in darkness; Martin Tangora, map-coloring problem with geometrical figures; Karen Spangebl, electrophoresis of protein; Eleanor Wright, methods and applications of chromatography; Merle Mitchell, mass analysis of crude oil; Edward Menbinick, control of house flies; David Isles, various features of oceanography; Daniel Larson, safety through photocells; Robert Shore, chondrification and ossification of the mouse embryo; Etsuyo Itokawa, search for compound effective against leukemia; Alan Moffet, determination of antenna radiation patterns; and David Mumford, a miniature relay calculator.



ENTOMOLOGY

Automatic Greenhouse Used in Insect Research

► A **GREENHOUSE** which automatically controls its own temperature and humidity, and partially regulates solar radiation has been placed in operation at the University of California's Citrus Experiment Station, Riverside, to aid orchard insect studies.

First of its kind to be constructed, it is named the "biotrone," meaning "balance of life." It is an insect-proof glass house equipped with automatically controlled heating and cooling units.

A set of aluminum louvers completely surrounds the house. These are operated by three solar thermostats, installed on top of the east, south and west sides of the structure. When the solar radiation reaches a given intensity, the thermostats automatically close the louvers to maintain their degree of warmth.

Temperatures can also be controlled in the greenhouse by a time clock. Days of varying length can be simulated at any time of the year by use of tungsten filament and fluorescent lamps and the louvers.

Dr. Charles A. Fleschner, entomologist, will direct experiments in the biotrone. He has found that variation in the physiological conditions of plants has a striking effect on the reproduction rate of mites feeding on plants and on their natural enemies.

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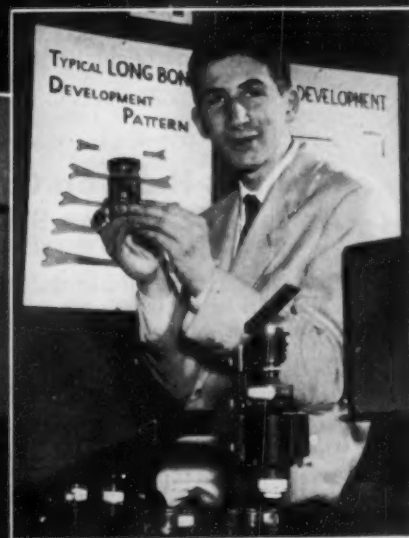
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MEDICINE

Cell Division Restrainers Give New Cancer Hope

► HOPE FOR chemical treatment of cancer through a new class of compounds is suggested by the American Cancer Society in announcing recent findings of research it supports.

The finding is that cell division, unrestrained in cancer, can be restrained by chemicals which exist in all living cells. This was discovered in research by Dr. Ernst J. Dornfeld of Oregon State College, Corvallis.

The compounds are called nucleotides. They "come together," explains the cancer society, "to form nucleic acids which, with protein, make up the basic living substance."

Dr. Dornfeld found that two types of cells, those covering embryonic rat ovaries and those in tissues snipped from young rat ears, will almost stop growing if treated with three of the four kinds of nucleotides. The three are cytidylic, guanylic and adenylic acids. The exception, which did not slow cell growth, is uridylic acid.

"Precisely what application this may have to cancer is not yet understood," states the cancer society.

"If," the society's statement continues, "these or related nucleotides exercise a more potent anti-growth effect on cancer cells than on normal cells, or if they completely stop the ever-dividing cancer cells, the nucleotides in some might be used to treat cancer."

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CHEMISTRY

Slush as Hard on Cars As Is Salt Water Spray

► SLUSH AND road materials thrown under cars by the wheels can cause as much corrosion as salt-water spray and industrial fumes.

F. L. LaQue, International Nickel Company corrosion engineer, pointed out to the Society of Automotive Engineers meeting in Detroit that the under-surfaces of cars usually are not protected as well as the showy outer-surfaces. The reduced protection plus road splash and accumulations of water in places where it dries slowly can cause serious corrosion.

Except for heavy reinforced asphaltic coatings being applied to under-bodies for sound deadening and to retard corrosion, protection normally is inadequate, especially on the interior of body panels. He said four coats of protective material might be applied to the outer surfaces, but only a single primer coat might be put on inner surfaces.

"It is not surprising that most corrosion of automobile bodies proceeds from the inner surfaces," Mr. LaQue said.

The severity of corrosion depends upon the nature and amount of corrosive pollutants in the air as well as the kind of mate-

rial thrown under the car by the wheels. High humidity, rainfall, dust, ashes and soot all promote corrosion. For automobiles, it is most severe around seashores and in heavily industrialized communities.

Although some steels resist corrosion better than others, the less-resistant ones are widely used by auto manufacturers because of their low cost and qualities of easy workability. They can be made more resistant to corrosion by amounts of such alloying elements as phosphorus, chromium and nickel. A phosphate treatment before painting also helps the metal withstand corrosion.

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CHEMISTRY

Chemical Eye Ready For Automatic Factories

► AN AUTOMATIC eye that controls chemicals is now ready to go to work industrially. Demonstrated in Norwalk, Conn., it not only sees all the components dissolved in a passing stream of liquid, but signals the valves that can change the proportions of those components if anything goes wrong.

Replacing the tedious operation which previously was used to draw off and analyze samples of liquids circulating through industrial pipelines, the new method gives the plant supervisor continuous information on how the reactions in his apparatus are progressing.

Infrared light passes through a little of the liquid flowing through a small by-pass tube, and is then analyzed by a special instrument which tells what parts of the light were absorbed by the liquid. From this characteristic pattern of absorption bands, the components of the liquid can be read.

Controls operated by the pattern of light and dark bands shown by the instrument can be set to open or close valves in the pipeline according to pre-arranged settings.

This brings one step closer the perfection of the automatic factory, according to Dr. Van Zandt Williams, vice-president and director of sales and research of the Perkin-Elmer Corporation in Norwalk, who arranged a recent demonstration.

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MEDICINE

Drug for Chronic High Blood Pressure

► "PROMISE IN the treatment of chronic high blood pressure" is the verdict given on a relatively new drug by a report from the American Medical Association in Chicago.

The drug is trade named Apresoline. The "promise" is seen in the favorable response of more than half of 97 patients whose cases are reported by Drs. R. D. Taylor, Harriet P. Dustan, A. C. Corcoran and Irvine H. Page of Cleveland in the association's *Archives of Internal Medicine*.

Science News Letter, March 14, 1953

IN SCIENCE

PSYCHOLOGY

Workers in "Like" Groups Up Production

► PRODUCTIVITY CAN be increased by more than a third, 36%, when workers are grouped together in "like" groups, Dr. Howard M. Newburger of the New York University psychology department told the New Jersey Psychological Association meeting in Princeton.

"Like" groups consist of workers who like each other and get along well together.

Although many employers have felt for a long time that people who get along well together are better producers, this is the first time that it has been demonstrated statistically, Dr. Newburger said.

He pointed out that employers can place workers in the proper "like" group by the use of simple psychological tests.

He warned that mixing people who are indifferent or antagonistic to each other in the same work group always results in decreased efficiency and output, and increased labor tensions.

Dr. Newburger urged executives to be consistent in their attitudes to people working under them. His statistics showed that consistently tough or consistently mild attitudes toward employees always paid off in higher efficiency. However, executive attitudes that vary from mildness to toughness, invariably result in decreased production and lower quality.

Science News Letter, March 14, 1953

TECHNOLOGY

Device Tells Whether Barn Needs Ventilation

► AN ELECTRONIC "brain" has been invented that tells farmers whether their barns need temperature or humidity control systems, or both.

Known technically as the "ventilation analogue computer," the device takes the guesswork out of a perplexing farm problem: whether the barn is properly air conditioned for good health and productivity of the livestock.

It considers the number of animals in the barn, figures in the heat and moisture they will give off, studies the heat and moisture gain or loss from other parts of the building, then tells the farmer whether he needs temperature or humidity controls in his barn, or both. It also tells him what size ventilating system he needs.

The farmer's helper was designed by William McGoldrick, Jr., a Minneapolis-Honeywell Regulator Company research engineer in Minneapolis.

Science News Letter, March 14, 1953

NE FIELDS

PHYSICS

Energy From Matter Annihilation Expected

► THE POSSIBILITY of obtaining vast amounts of energy from the annihilation of matter was suggested to National Science Talent Search winners in Washington by Dr. I. I. Rabi, Nobelist in physics of Columbia University, New York.

Explaining that the opportunities in exploration of matter and energy are "open-ended," Dr. Rabi urged the young scientists to help discover new methods of energy production by investigation of particles of matter.

The existence or creation of anti-matter, or the negative analogue of the proton (heart of the hydrogen atom), is theoretically possible. If this particle were to combine with a proton, two billion electron volts of energy would be let loose. This is a thousand times as much as the energy release of the similar annihilation of an electron (particle of electricity) which is a million electron volts.

Thus, Dr. Rabi explained, there are probably discoverable in the future methods of energy production much greater than the fission of matter in the atomic bomb or the conversion of hydrogen into helium such as occurs by fusion in the H-bomb and the sun.

Studies of protons and neutrons, now under way in powerful accelerators which are beginning to duplicate the energies of the cosmic rays, may lead to the discovery of the new potential sources of energy. The number of kinds of subatomic particles known to exist has increased in the past few years and physicists are exploring particularly the mesons first found in the debris of cosmic ray collisions.

Science News Letter, March 14, 1953

MARINE BIOLOGY

Expect Another Catch Of Rare Fossil Fish

► THE FABULOUS coelacanth, the "living fossil" fish recently captured near the east African coast, was deadlier than scientists are happy about before it could be properly preserved.

Prof. J. L. B. Smith, the South African scientist responsible for the discovery of the coelacanth, a very primitive type fish thought extinct for 50,000,000 years, reported in *Nature* (Feb. 28) that the 120-pound specimen was mutilated more than had been realized at first. (See SNL, Jan. 17, p. 38).

However, Prof. Smith stated, most of the soft parts of the fish remain, extending enormously the scope of investigations that can be carried out on the specimen.

Discovery of the coelacanth is of great importance to biology, because the fish is one of a group believed to be an intermediate stage between water and land animals—fish and amphibians.

On the chance that more coelacanths may turn up, Prof. Smith plans to leave a supply of preserving materials on the Comoro Islands, where the fish was caught. He said he is preparing detailed instructions, telling what to do and what not to do with the fish, which he will distribute widely among the fishermen in areas where coelacanths may be found.

The five-foot coelacanth had its skull bashed in by the fisherman who caught it. After spending some hours in the African sun, it was split from head to tail and salt was dumped into the cuts to try to hold back decay. Later the island's entire supply of formaldehyde was pumped into it, before the fish was flown to the mainland in a special plane.

When Prof. Smith proudly presented the specimen to South African Prime Minister Daniel Malan, his words included an apology for the odor.

Science News Letter, March 14, 1953

PHYSICS

New Invisible Light From Hydrogen Atom

► EXCITED HEARTS of hydrogen atoms are exciting physicists. For the first time in nearly 30 years, a new series of atomic spectrum lines has been found. This is the sixth series.

Light given off by hydrogen, the most fundamental element, when an electric spark jumps through a tube containing that gas, has just been analyzed into the five well-known series of lines by which atomic energy is measured, plus a sixth series. Prediction of this sixth series of lines, in the infrared part of the spectrum, has been made during the past three decades.

Announcement that the new kind of invisible light from the hydrogen atom has been found was made by Dr. Curtis J. Humphreys of the National Bureau of Standards. Earlier discoveries of the five series of lines were made by physicists whose names the line series carry. These are the Lyman series in the ultraviolet region of the spectrum, the Balmer series in visible light, and the Paschen, Brackett and Pfund series in the infrared.

Prediction of a seventh series of lines, to be found still farther toward the infrared end of the spectrum, where light waves change into heat waves, is made by Dr. Humphreys.

Although of no practical use at the present time, the spectrum lines of hydrogen are of great importance in theory of the way all chemical elements, and therefore all kinds of matter, are built up. Fusion of hydrogen into helium, the process used in the hydrogen bomb, is one of the ways in which such building up of matter can be made to take place.

Science News Letter, March 14, 1953

VETERINARY MEDICINE

Hard to Detect Source of Sheep Disease, Scrapie

► A DEADLY virus disease of sheep has broken out in Ohio and Illinois, the U. S. Department of Agriculture reported. All animals known to be infected by the disease, scrapie, have been destroyed, the Agriculture Department said.

The scrapie virus only attacks sheep under about 18 months of age, Dr. Leigh T. Giltner, assistant chief of the Agriculture Department's pathology division, reported. Although the disease is generally fatal to infected animals, it spreads only very slowly within a flock, Dr. Giltner said.

Scrapie disease is extremely difficult to detect at its source because there is an incubation period of up to two years before its effects become noticeable in a flock. Complete destruction of all animals in a flock known to contain infected animals is the only known sure way of combating the disease.

An outbreak of scrapie in California last year was wiped out by slaughter of infected flocks, so that there is no known case of scrapie in that state now.

There is no indication that the present outbreak has any connection with the California infections.

Symptoms of scrapie start with a violent trembling of the ears, lips and limbs of infected animals. This is followed by serious itchiness, in which the sheep often scrapes off areas of wool in its constant scratching. In a few months, the animals lose weight, become emaciated and finally die.

Science News Letter, March 14, 1953

TECHNOLOGY

New Brakes for Cars Promise Better Stopping

► THREE MAJOR American auto manufacturers currently are testing a new type of brake drum designed to make modern driving safer, George T. Ladd, Fairchild Engine and Airplane Corporation engineer, reported to the Society of Automotive Engineers meeting in Detroit.

The brakes feature aluminum cooling-fins bonded to a cast-iron liner. The cooling fins permit the brakes to be used more often without overheating. Overheated brakes, he said, can "fade out" on heavy trucks and trailers creeping down mountains.

Heavy-duty brakes are taking on more significance now that automatic transmissions and fluid couplings are going into modern cars. These transmissions cut down the braking effect the engine exerts through regular transmissions. Coupled with more powerful motors and high-speed highways, this means brakes are needed more often by the average motorist. The brakes must be rugged enough to withstand the extra use, he said.

Science News Letter, March 14, 1953

ELECTRONICS

The Fabulous Midget

Transistors, flecks of germanium with spider-like wire legs, may revolutionize the electronics industry by replacing the vacuum tube. They may even work on body heat alone.

By HARLAND MANCHESTER

► IF SOMEONE invented a household light bulb smaller than a pencil eraser which would never burn out, would cut your light bill 99 percent, would not get hot and could be thrown at a brick wall without breaking, you would probably call it an industrial miracle of the first order.

That is about what has happened to the radio tube and its big glass-clad family of electronic brethren. The transistor, a tiny speck of solid germanium metal sprouting hairlike wires, has now gone to work after a seven-year gestation in the Bell Telephone Laboratories, and it is unanimously hailed by the world's scientists as the greatest advance in communication since De Forest invented the radio, or "audion," tube 46 years ago.

The little "spider," so small that you can hold a hundred in one hand, is slated to cut the size and weight of our familiar communication devices to a fraction of their present size, with striking reductions in power consumption and improvements in reliability and length of life. The transistor opens exciting new frontiers in radio, television, radar, guided missiles, automatic gun-sighters and the whole field of military and aviation electronics.

The familiar radio tube—sire of the whole 20th-century electronics industry—is really a glorified light bulb. When Edison found that the heated filament in a light bulb "boiled off" the negative particles called electrons, he put a positive terminal inside the bulb to capture the leaping stream of free electrons and set up a continuous current.

Air Wave Built Up

Then Lee De Forest found a way of piping into the bulb feeble radio-wave vibrations from an antenna; these vibrations impressed their pattern on the much stronger current from the house circuit, thus building up the air-wave whisper into a shout. Since De Forest's epochal discovery, his tube and its electronic cousins have been vastly improved, but they still have the limitations of their light-bulb ancestor: heat makes them eventually burn out.

When Dr. William Shockley and his Bell colleagues started work on the transistor project, it had long been known that certain crystalline metals like germanium could be used in certain limited ways in the control of electric currents.

A research group at Purdue University headed by Dr. Karl Lark-Horovitz made

important contributions in purifying germanium for use as a semi-conducting material, and by World War II a few germanium control devices were in use. Then in 1945 Dr. Shockley caught a vision of their great future and started intensified work with nine colleagues at the Murray Hill, N. J., plant of the Bell Telephone Laboratories.

The Bell scientists found that if they took ultrapure germanium and introduced meticulously measured impurities in a certain way, they upset the metal's orderly atomic pattern and created a restless structure full of submicroscopic holes and homeless, wandering electrons. When a current passed through the metal it touched off a complicated game of musical chairs as the holes moved like bubbles in a liquid and the loose electrons rushed to fill the empty places.

Rigging the game by controlling the distribution of holes and electrons, they found that they could make the current perform various stunts. Like De Forest, they could stick in a third wire from a radio antenna and force the current to amplify vibrations which originated in the larynx of Dinah Shore.

Since you do not have to build a fire, so to speak, to boil the electrons out of the metal, you save a lot of fuel in the form of electric power. You also save money now spent in getting rid of the unwanted heat—often a serious ventilation problem. And since heat and glass are eliminated, you can pack the transistors together like sardines.

I watched Jack Morton, who helped to build the transistor, chew a piece of blotting paper to give it acid from his saliva, slap it on a 25-cent piece, and attach wires from a tiny transistor sound-wave broadcaster. The power generated by this impromptu battery—2/100,000,000ths of a watt—was enough to run the device.

This points the way to vest-pocket "survival radios" which would need no batteries or built-in power. Easy to carry, they could be used by campers, hunters, prospectors and ranchers.

Heat Can Run Them

A little heat will run them, possibly even body heat. Morton ran a transistor radio on power obtained from a small thermocouple, made of two thin strips of dissimilar metals to provide a kind of battery. A lighted cigarette held near the device gave enough heat to operate it. Even body heat would do. Or you might get enough from one winding of a watch spring to run a



GERMANIUM WAFER—Magnified 20 times on a special contour projector, a germanium wafer looks like this. The black lines are the boundaries of single crystals of germanium.

powerful eight-transistor receiver for several hours.

One of the most popular uses of the transistor will be in the automobile radio. Such radios can be made one-tenth the size of present ones, and laboratory models use no more power than it takes to run the little light bulb behind the dial—a small fraction of a tube radio's drain on the battery. The present auto radio uses a vibrator, a transformer and a rectifier to step up the battery's six volts to the 130 needed to power the tubes. These devices, which add to cost, weight and size, and can get out of order, are not needed in a transistor radio, which can operate directly from the battery.

No Warm-Up Needed

There need be no tube replacement either. Although the oldest transistors "life tested" by the Bell laboratories have barely passed their fourth birthday, Bell engineers hope that with further development they may run indefinitely. So transistors will not be plugged in, but will be wired in permanently, saving the cost and space of sockets. As a final advantage, a transistor radio comes on full volume the split-second you turn the switch—there is no waiting for tubes to warm up. Such a radio is smaller, lighter, simpler and more reliable than any now in use.

Nine manufacturers of hearing aids are already using transistors in a job where small size and weight, longevity and low operating cost are at a premium.

RCA, which manufactures transistors, has built a portable television receiver which weighs only 27 pounds because it uses transistors, 37 of them, eliminating all tubes except the picture tube itself.





Among other RCA creations is a "roving microphone" which transistors have boiled down to the size of a cigar. Sound is picked up and broadcast by an unconnected transmitter, enabling a speaker or performer to move about a stage or TV or film set without tripping over wires.

Electronic "robot brains" are already performing in a few hours paper work which once took years, but these machines have

run into limitations imposed by the power-hungry tubes—hot and bulky and comparatively short-lived. Today's biggest thinking machines are no more complicated than the nervous system of a fish; but a machine duplicating man's nerve structure would be larger than the Empire State Building. The transistor can cut these temperamental dinosaurs down to practical working size, and this job alone may turn out to be its most important contribution to human progress.

A transistor electronic computer built by RCA is one-tenth the size and uses one-thirtieth the power of a similar device using tubes.

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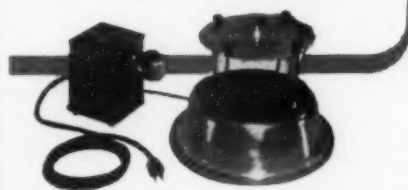
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Next spring Bell will install in its Pittsburgh telephone office a kind of transistor thinking machine which will "remember" all possible routes a message can take from that city to any point in the country. When a call is blocked on one route by busy lines or local trouble, the robot will detour the call to its goal, mapping the route and giving orders in about a third of a second. Bell has tried to use tubes for this purpose, but they take too much space, power and maintenance. In Englewood, N. J., transistors were installed last fall as a part of the equipment which enables telephone subscribers to dial numbers directly in distant cities. This direct long-distance telephone service will gradually be installed in most large centers.

Most transistors are now earmarked for national defense, and production bottlenecks must be broken before they can be made in the great quantities needed to fill civilian demands. The metal must first be super-refined to a fantastic degree of purity—more than one part of foreign matter to 100,000,000 parts of germanium makes it unfit for use. "Doping" it with controlled impurities is equally fussy business. Workers who assemble transistors peer through microscopes and use delicate electronic "feelers" to guide them when vision is useless. But the best brains in American industry, backed by unlimited funds, say that mass production problems can be licked.

The first transistor was announced in

1948, and since then scientists and engineers have been improving it. The industry has already spent \$10,000,000 on development, and 37 foreign and domestic corporations, among them industrial giants, like IBM, IT&T, General Electric, Westinghouse and Raytheon, licensed to manufacture the mighty midget, are strongly competing to put it in harness.

No one can state with certainty when transistor radios and television sets will be on the market, but some engineers pick 1956.

Great numbers of electronic tubes, now manufactured at the rate of half a billion a year, will still be needed for jobs the germanium spider cannot do—in shortwave therapy, radio nailing and welding, where heat is needed, for TV picture tubes. And the transistor will expand the horizons of communications and industry to create new demands for tubes.

In less than half a century the electronic tube has changed the world, and the effect

of the transistor on all our lives may be equally potent.

This article was prepared for SCIENCE NEWS LETTER in cooperation with the Reader's Digest. It will appear shortly in that magazine.

Science News Letter, March 14, 1953

INVENTION

Design Diving Bell for Underwater Prospecting

► GEOPHYSICISTS PROSPECTING for oil beneath the surface of the Pacific and Gulf will have to go underwater if an invention patented by Clemille F. Sellers, El Banco, Colombia, South America, comes into general use. He has invented a diving bell which can carry a geophysicist and his prospecting instruments down to the bottom for use. Patent number is 2,627,727 and it is assigned to Robert H. Ray, Inc., of Texas.

Science News Letter, March 14, 1953

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALLAN AND TRISHA VISIT SCIENCE PARK—Caroline Harrison and Bradford Washburn—Little, Brown, 59 p., illus., \$2.00. In this book for children, a small boy and girl with their mother visit the Museum of Science and learn a great deal from the exhibits which they could work themselves.

ANIMAL MICROLOGY: Practical Exercises in Zoological Micro-technique—Michael F. Guyer—University of Chicago Press, 4th rev. ed., 331 p., illus., \$4.75. This classic text for beginners in animal microscopy has again been revised to include recent advances in technique.

ANTHROPOLOGY TODAY: An Encyclopedic Inventory—A. L. Kroeber, Chairman—University of Chicago Press, 966 p., \$9.00. Fifty papers by the world's leading anthropologists constituting a summary of the knowledge obtained to date in all phases of anthropology.

ARCTIC SOLITUDES—Admiral Lord Mountevans—Philosophical Library, 143 p., illus., \$4.50. The author, himself a well-known Arctic explorer who has been taking part in expeditions since the beginning of the century, tells here the story of trips that have been made to the top of the world. Excellent photographic illustrations.

ASTRONOMY FOR EVERYMAN—Martin Davidson, Ed.—Dutton, 494 p., illus., \$5.00. A popular presentation of all phases of astronomy, including instrumental equipment, aims and methods of the astronomer, a study of the heavens and a brief history. Excludes, for the most part, mathematics.

THE ATOM STORY: Being the Story of the Atom and the Human Race—J. G. Feinberg—Philosophical Library, 243 p., illus., \$4.75. The history of atomic development is traced from Democritus of 500 B.C. to the day of the hydrogen bomb.

BUILDING AMERICA'S HEALTH: Volume 4, Financing A Health Program for America—President's Commission on the Health Needs of the Nation—Government Printing Office, 363 p., paper, \$1.50. Presents some of the basic facts on health expenditures. Includes statements by the members of the Commission's Panel on Financing a Health Program.



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The SOVIET IMPACT on SOCIETY

by Dagobert D. Runes

Preface by Harry Elmer Barnes

In what manner has Kremlin-controlled Sovietism raised or lowered human standards? Is man in Soviet society master of his own fate? May he follow unhampered his self-chosen vocation and avocation? Can he express his ideas and feelings as he wishes? Can he join his neighbors in groups, unions and confederations? Are his social or cultural activities dictated by political potentes?

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CARL LINNAEUS—Knut Hagberg, translated by Alan Blair—Dutton, 264 p., illus., \$4.50. A biography of the great Swedish botanist, writer and philosopher who endeavored to relate his botanical system to a comprehensive view of the design and coherence of Creation.

CARNEGIE INSTITUTION OF WASHINGTON, YEAR BOOK No. 51—Carnegie Institution of Washington, 286 p., paper, \$1.00. This 1951-1952 annual report includes resumés of the activities of the departments of astronomy, terrestrial sciences, biological sciences, archaeology and of the research associates connected with the Carnegie Institution.

CHEMISTRY: A Course for High Schools—John C. Hogg, Otis E. Alley, and Charles L. Bickel—Van Nostrand, 3rd ed., 772 p., illus., \$3.96. This revised edition has expanded sections on atomic structure, radioactivity, uranium, titanium and zirconium.

CHILD DEVELOPMENT: The Process of Growing Up in Society—William E. Martin and Celia Burns Stendler—Harcourt, Brace, 519 p., illus., \$6.50. Tracing for parents, teachers and physicians the day-by-day growth of children—physically, mentally, and socially.

CHILDREN IN PLAY THERAPY: A Key to Understanding Normal and Disturbed Emotions—Clark E. Moustakas—McGraw-Hill, 218 p., illus., \$4.50. Shows how normal children, or children with temporary or deep emotional problems, express their feelings through such objects as clay, paint, sand and dolls.

COLOR IN THE GARDEN—Norman Taylor—Van Nostrand, 118 p., illus., \$2.00. Enables the gardener to plan and produce a garden utilizing the predominant color of his choice, and to have continuous bloom in that color throughout the growing season.

ELECTRONICS MEASUREMENTS—Frederick E. Terman and Joseph M. Pettit—McGraw-Hill,

2nd ed., 707 p., illus., \$10.00. Both a college text and a reference work for the practicing engineer, this covers measurement fundamentals in radio, television, radar and other pulsed systems, and microwaves.

FERROELECTRICITY—E. T. Jaynes—Princeton, 137 p., paper, \$2.00. A general introduction to, and a guide to the literature published on, the subject of ferroelectricity.

FLATLAND: A Romance of Many Dimensions—Edwin A. Abbott—Dover, 6th ed., 103 p., illus., paper, \$1.00, cloth, \$2.25. Bringing back into print this delightful fantasy mainly concerned with "life" in a two-dimensional world written some 70 years ago by an imaginative man.

FOOD FOR YOUR HEART: A Manual for Patient and Physician—Department of Nutrition, Harvard School of Public Health, Harvard University—American Heart Association, 48 p., paper, 25 cents. Describes the relation of nutrition to heart disease and gives the sodium content of foods and water supplies. With suggested diets and menus.

GETTING THE MOST OUT OF A POWERBOAT—Lauren and Madge Clark—Norton, 256 p., illus., \$3.95. Covers all phases of owning, maintaining and cruising in powerboats.

HISTORIC RESEARCHES: Chapters in the History of Physical and Chemical Discovery—T. W. Chalmers—Scribner, 288 p., illus., \$5.00. Intended as a background for modern physics and chemistry, this work tells of the origins of such things as friction, X-rays, chemical elements and atoms, etc.

THE HUMAN SENSES—Frank A. Geldard—Wiley, 365 p., illus., \$5.00. Each of the sense channels is treated from the standpoint of physics of stimuli, and anatomy and physiology of the sense organ, before discussing the phenomena of the sense itself.

MANUAL OF THE NORTH AMERICAN SMUT FUNGI—George W. Fischer—Ronald, 343 p., illus., \$8.75. Enables the plant pathologist, agronomist or mycologist to identify recognized and classified smut fungi of this continent.

MICROMETEOROLOGY: A Study of Physical Processes in the Lowest Layers of the Earth's Atmosphere—O. G. Sutton—McGraw-Hill, 333 p., illus., \$8.50. Provides training in the specialized techniques that have evolved to solve problems in agricultural meteorology, hydrology, air pollution, etc.

MIGRATORY WORKERS: The Mobile Tenth of American Agriculture—Lowry Nelson—National Planning Association, 33 p., paper, 50 cents. Proposes private and voluntary measures, supplemented by legislation, to relieve the acute social and economic problems of these people.

MUSICAL ENGINEERING: An Engineering Treatment of the Interrelated Subjects of Music, Musical Instruments, Speech, Acoustics, Sound Reproduction, and Hearing—Harry F. Olson—McGraw-Hill, 369 p., illus., \$6.50. Aids the study, measurement and analysis of audio problems, including those of the recording, transmission and broadcasting of music.

ONE HUNDRED YEARS OF ENGINEERING PROGRESS WITH WOOD—Timber Engineering Company, 109 p., illus., paper, free upon request direct to publisher, 1319 Eighteenth St., N.W.,

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Washington 6, D. C. Compilation of outstanding papers presented at the wood symposium held during the Centennial of Engineering Convocation in Chicago, Sept. 3-13, 1952.

O RUGGED LAND OF GOLD—Martha Martin—*Macmillan*, 223 p., \$3.00. The story of a woman pioneer as she lived alone and had her baby in the desolate cold of Alaska.

THE PERMANENT GARDEN—Norman Taylor—*Van Nostrand*, 128 p., illus., \$2.00. How to have a year round garden using only trees, shrubs and vines that require a minimum of maintenance expense and care.

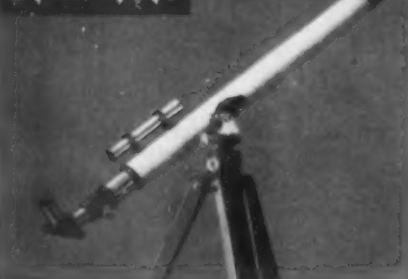
PHANTASY IN CHILDHOOD—Audrey Davidson and Judith Fay—*Philosophical Library*, 185 p., \$4.75. By watching little children in their daily activity and play and by listening to their questions, it has been possible to show that much of the phantasy noted by Freud dates from very early childhood.

PREVIEW FOR TOMORROW: The Unfinished Business of Science—Bruce Bliven—*Knopf*, 348 p., illus., \$5.00. Many problems of today, including population questions, nutrition, conservation, medicine, engineering, psychology and psychiatry, can be remedied by science. This tells what science is doing and can do to solve them.

PROGRESS IN THE CHEMISTRY OF FATS AND OTHER LIPIDS: Volume I—R. T. Holman, W. O. Lundberg, and T. Malkin, Eds.—*Academic Press*, 186 p., illus., \$7.00. The first of an annual series. Of interest to the specialist in this field, the chemist, the biochemist and the medical scientist.

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THE RADIO AMATEUR'S HANDBOOK—Headquarters Staff—*American Radio Relay League*, 30th ed., 548 p., illus., paper, \$3.00. Indispensable for the "ham," and useful for anyone having to do with radio.

SELECTED PETROGENIC RELATIONSHIPS OF PLAGIOCLASE—R. C. Emmons, Ed.—*Geological Society of America*, 142 p., illus., \$2.00. Material for this study was selected insofar as possible from normal plutonic and volcanic rocks.

SHIPS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. Introducing children to the sea and things nautical.

SOLAR EPHEMERIS AND POLARIS TABLES 1953—Herman J. Shea, Ed.—*C. L. Berger*, 123 p., illus., paper, 50 cents. Data for land surveyors.

SOME THINGS YOU SHOULD KNOW ABOUT MENTAL AND EMOTIONAL ILLNESS—*National Association for Mental Health*, 3 p., illus., paper, free upon request direct to publisher, 1790 Broadway, New York 19, N. Y. Here are some of the important facts about mental illness, what it is and how it can be distinguished from emotional illness or neurosis.

STATISTICAL ASTRONOMY—Robert J. Trumpler and Harold F. Weaver—*University of California Press*, 644 p., illus., \$7.50. Introduces the graduate student to the principal statistical problems in astronomy, to their mathematical formulation, and to methods and techniques of their solution.

THEORY OF BEAUTY: An Introduction to Aesthetics—H. Osborne—*Philosophical Library*, 220 p., \$4.75. The author, a graduate of Cambridge University, England, attempts here to lay the basis for a better understanding of that which is beautiful.

THIRTY-EIGHTH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS, 1952—*Government Printing Office*, 69 p., illus., paper, 55 cents. This administrative report, without the technical reports, points out that NACA research is decreasing while the need for it is increasing.

TORNADOES OF THE UNITED STATES—Snowden D. Flora—*University of Oklahoma Press*, 194 p., illus., \$3.50. Provides a way to learn about the frequency and damage of these violent and spectacular storms, their causes, methods of forecasting and means of protection.

TRAINS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. Just the thing to let little Johnny take along on that train ride.

TREE AND SHRUB SPECIES FOR THE NORTHERN GREAT PLAINS—Ernest J. George—*Govt. Printing Office*, USDA Circular No. 912, 46 p., illus., paper, 20 cents. Trees and shrubs give needed protection against cold winds and drifting snow. They also attract beneficial birds. This report gives results of tests for suitability to the climate.

TRUCKS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. A book for children about trucks and highway transportation.

TUNGSTEN: Its Metallurgy, Properties and Applications—Colin J. Smithells—*Chemical Publishing Co.*, 326 p., illus., \$8.50. A book for metallurgists and students.

ULCERS AND STOMACH TROUBLES: Their Causes and Relief—Sidney A. Portis—*Hanover House*, 128 p., illus., \$2.00. For the person who is willing to face facts and wants to work successfully with his own doctor to achieve an eventual, and more rapid, cure.

Science News Letter, March 14, 1953

Questions

CHEMISTRY—How can chemical eye control an automatic factory? p. 168.

...

DENTISTRY—Why is the value of ammoniated dentifrices doubtful? p. 164.

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FORESTRY—What is gained by grafting hybrid pines? p. 166.

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PSYCHOLOGY—How is a child's I.Q. determined? p. 164.

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What is the advantage of "like" groups working together? p. 168.

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Photographs: Cover, pp. 163 and 167, Fremont Davis; p. 165, Armed Forces Institute of Pathology; p. 170, General Electric Company; p. 176, Lynch Camera Shop.

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"Another gravitational problem is that of an atmosphere outside a planet. This has a practical bearing on the earth's atmosphere. Also considered is centrifugal force. This is a slightly distorted form of gravity, and is quite interesting.

"I have obtained general solutions for all these cases and numerical solutions for some of them. Although the majority of my cases will be found as problems in text-

books on differential equations, the work is entirely my own, and the liquid sphere problem (#3), as far as I know, is original."

—From the report of E. Alan Phillips.

MONSKY WRITES

"A. Subject of the Note

"The basic problem of geometrical optics is determining the path of a ray of light in a medium. This note will derive a general differential equation for a heterogeneous medium in a plane, solve the equation for several special cases involving radial symmetry, and consider the existence of solutions with two intersecting tangents at a point (a corner).

"This is a non-relativistic study. Also, phenomena such as emission, absorption and diffraction will not be taken into account, and the wave theory of light will not be used."

—From the report of Paul H. Monsky.

Science News Letter, March 14, 1953

Do You Know?

American motorists rolled up 500 billion miles of travel in 1952.

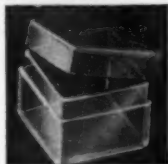
It is estimated that there are three rats for every human being on the earth.

More than a million big-game animals are harvested yearly in North America.

Water in the South Pacific's deep Tonga Trench shows a marked temperature rise below 18,000 feet.

The annual death rate from automobile accidents is three times the casualty toll for one year of the Korean War.

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Science News Letter, March 14, 1953

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❁ **SNAKE-PROOF PANTS** for sportsmen and others who must expose themselves to rattlesnakes and copperheads weigh just a little more than ordinary duck pants. The snakeproof trousers are lined completely around the legs and above the knees with fine wire mesh padded with three layers of duck

Science News Letter, March 14, 1953

❁ **SHIPPING CONTAINER** for radioactive cobalt 60 and other industrial materials used in radiography holds up to about 800 millicuries of activity. The container has an outer shell of $\frac{3}{8}$ -inch malleable iron that is filled with lead. This provides an effective shielding equivalent to four inches of lead. The container's lid can be locked closed to keep out unauthorized persons.

Science News Letter, March 14, 1953

❁ **MOUSE-FEEDING STATION** is designed to hold dry bait away from the floor and to keep the bait clean and dry. The plastic device stands about three inches tall and has no moving parts. Mice can get at the bait through mouse-size holes in the station's base.

Science News Letter, March 14, 1953

❁ **ADHESIVE BALM** is sprayed on the skin directly from the can, as shown in the photograph, before adhesive tape or plaster casts are applied. The balm is said to form



a highly antiseptic, non-toxic, plastic-like film that allows dressings to hold more firmly yet be easily removed.

Science News Letter, March 14, 1953

❁ **PAINT SPOUT** fits gallon-size paint cans and keeps paint from getting into the lid-sealing groove while the paint is being stirred, mixed, poured or used. The spout permits the painter to pour the paint exactly

where wanted, and is "ideal for filling roller pans, fountain rollers and spray guns," the manufacturer states.

Science News Letter, March 14, 1953

❁ **SOIL-BORING MACHINE** can be mounted on a trailer and will drill clean boreholes up to 20 inches in diameter and 16 feet deep in most soils. Powered by its own engine the unit will bore vertical or inclined holes at a rate of about one foot a minute.

Science News Letter, March 14, 1953

❁ **THERMOMETER CLAMP** for the laboratory fits over the edge of any beaker and holds the thermometer against the side of the vessel in an easy-to-read upright position. The thermometer can be slipped up or down through the clamp. The clamp also will hold glass stirring rods and metal electrodes.

Science News Letter, March 14, 1953

❁ **ANTI-FUNGI CHEMICAL** can be added to paints to control mold growth. It also protects textiles from loss of tensile strength due to fungi attack, prevents the growth of fungi on vinyl plastic films and coated fabrics, preserves articles made of synthetic rubber and prolongs the life of cords, webbing, twine and rope, the manufacturer reports.

Science News Letter, March 14, 1953

• Nature Ramblings •

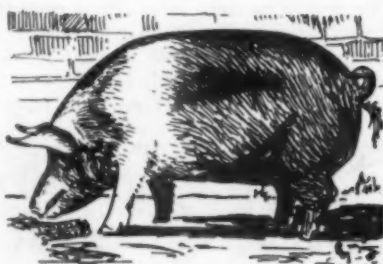
► **PREPARATIONS FOR St. Patrick's Day** festivities almost inevitably feature, amid the verdant shamrocks, a plump pink pig, perhaps with a green ribbon tied around his neck.

But if mention is made of this incredibly well-scrubbed little porker he is usually referred to as "Paddy's pig," the implication being that he is the property of some later, humbler namesake of the great saint, as if it were somehow improper to associate swine with the austere, white-bearded bishop that is the usual picture of St. Patrick.

We should remember, however, that there was a time in Patrick's life when he wore neither beard nor mitre—though he may have had to live austere enough even then. And in those days, if the story of his early life as commonly told has any truth in it, he had a good deal to do with pigs.

The tale that as a lad he was kidnaped by pirates and sold into bondage in Ireland,

St. Patrick's Pets



serving some years as a swineherd, is at least as credible as any other part of the many legends that are handed down from generation to generation concerning the famous St. Patrick.

It may even help explain the near-miraculous strength and energy which he brought to his incessant travels and hard labors throughout a long life. For herding swine in the Irish woods a millenium and a half

ago was no job for a milksop. The pigs of Patrick's day were slab-sided, fleet-footed, thoroughly "ornery" creatures, more like our Arkansas razorbacks than the tame, sleek, slow-moving porkers of present-day pigpens.

Keeping them from straying was a job for a young athlete. If the younger Patrick really ever was a swineherd, he got the full benefits of rugged outdoor living and plenty of hard exercise.

Not that St. Patrick would disapprove the kind of pigs they raise in Ireland nowadays, if he should chance to stroll through a country fair in his beloved island. For like most saints—especially those burdened with bishoprics—Patrick was a practical man, desiring to see his people prosperous as well as virtuous; and the modern pig, yielding fuller-fleshed hams and longer rashers of meatier bacon, would undoubtedly please his judicious eye, as it also pleases the modern palate.

Science News Letter, March 14, 1953